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From (2), we easily get $x=a\log_e[(y+\sqrt{y^2-a^2})/a]=a\log_e[(s+\sqrt{s^2+a^2})/a]=(s^2-y^2)/2y\log[(s+y)/(s-y)]\div\log_{10}e$.

$\therefore\ \log x=\log(s+y)+\log(s-y)+\log[\log(s+y)-\log(s-y)]-\log y-\log[2\log_{10}e]$.
$=\log(s+y)+\log(s-y)+\log[\log(s+y)-\log(s-y)]+\text{colog}\,y+0.0612$.

From this equation, since $x=40$m and $s=50$m, we find, by the Method of Double Position, the value of $y=26.53$m which is called the sag.

The tension at $A=wa=w\left(\dfrac{s^2-y^2}{2y}\right)=1559.78$ oz., and $\dfrac{FI}{EI}=\dfrac{a}{s}=.6797$ the *batter*.

From the above equations we may obtain the four propositions as given in Wentworth and Hill's High School Arithmetic.

35. Proposed by B. F. FINKEL. Professor of Mathematics in Kidder Institute, Kidder, Missouri.

Between Sing-Sing and Tarry-Town, I met my worthy friend, John Brown,
And seven daughters, riding nags, and every one had seven bags:
In every bag were thirty cats, and every cat had forty rats,
Besides a brood of fifty kittens. All *but* the nags were wearing mittens!
Mittens, kittens—cats, rats—bags, nags—Browns,
How many were met between the towns?
[From *Mattoon's Common Arithmetic.*]

Solution by FRANK HORN, Columbia, Missouri.

II.
1. 8=number of Browns met.
2. 8=8×1=number of nags.
3. 56=8×7=number of bags.
4. 1680=30×56=number of cats.
5. 67200=1680×40=number of rats.
6. 84000=1680×50=number of kittens.
7. 167888=Browns+cats+rats+kittens.
8. 335776=167888×2=number of mittens worn provided that each person, cat, rat, and kitten wore one pair.
9. 636616=Browns+nags+bags+cats+rats+mittens+kittens.

III. ∴ The number of objects and persons met amounted to 636616.

NOTE.—The result given in Mattoon's Arithmetic is 2184192. What interpretation did Mr. Mattoon give to the problem?—EDITOR.

PROBLEMS.

42. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

If $m=2$ct. be the interest on $M=100$ct. for $p=10$ days, find the yearly rate per cent.

43. Proposed by B. F. BURLESON, Oneida Castle, New York.

A, in a scuffle, seized on $\frac{2}{3}$ of a parcel of sugar plums; *B* caught $\frac{3}{8}$ of it out of his hands, and *C* laid hold on $\frac{3}{10}$ more; *D* ran off with all *A* had left, except $\frac{1}{7}$ which *E* afterwards secured slyly for himself; then *A* and *C* jointly